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(54) Title: POWER CABLE COMPOSITIONS FOR STRIPPABLE ADHESION

(57) Abstract: The present invention is a semiconductive power cable composition made from or containing (a) a mixture of a high-temperature polymer and a soft polymer, and (b) a conductive filler, wherein a semiconductive cable layer prepared from the composition strippably adheres to a second cable layer. The invention also includes a semiconductive cable layer prepared from the semiconductive power cable composition as well as a power cable construction prepared by applying the semiconductive cable layer over a wire or cable.

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AMENDED CLAIMS

[received by the International Bureau on 19 October 2004 (19.10.04);
original claim 1 amended, claims 2, 3 cancelled, claims 4-21 renumbered to 2-19, former
claim 16 (now 14) amended]

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original claim 1 amended, claims 2, 3 cancelled, claims 4-21 renumbered to 2-19, former
claim 16 (now 14) amended]

- 1 1. A semiconductive power cable composition comprising:
 - 2 a. a mixture of a high-temperature polymer and a soft polymer; and
 - 3 b. a conductive filler,
- 4 wherein
 - 5 (i) a semiconductive cable layer prepared from the composition strippably
 - 6 adheres to a second cable layer,
 - 7 (ii) in the absence of a curing agent, the semiconductive cable layer having
 - 8 a heat resistance of less than 100% as measured by a Hot Creep test at
 - 9 a testing temperature of 150 degrees Centigrade,
 - 10 (iii) the high temperature polymer being a polymer suitable to impart heat
 - 11 resistance to the semiconductive cable layer, and
 - 12 (iv) the soft polymer being a polymer that enhances the processing
 - 13 characteristics of the high temperature polymer.
- 1 2. The semiconductive power cable composition of Claim 1 wherein the high-
2 temperature polymer is selected from the group consisting of polypropylenes,
3 polyesters, nylons, polysulfones, and polyaramides and the soft polymer is selected
4 from the group consisting of polyethylenes, polypropylenes, polyesters, and rubbers.
- 1 3. The semiconductive power cable composition of Claim 2 wherein the high-
2 temperature polymer is a polypropylene and the soft polymer is a polyethylene.
- 1 4. The semiconductive power cable composition of Claim 3 wherein the
2 polyethylene is a copolymer of a polar monomer and a nonpolar monomer.
- 1 5. The semiconductive power cable composition of Claim 1 wherein the
2 conductive filler is selected from the group consisting of carbon blacks, carbon fibers,
3 carbon nanotubes, graphite particles, metals, and metal-coated particles.
- 1 6. The semiconductive power cable composition of Claim 1 wherein the second
2 cable layer being chemically-crosslinked.
- 1 7. The semiconductive power cable composition of Claim 1, further comprising a
2 curing agent.
- 1 8. The semiconductive power cable composition of Claim 1 further comprising a
2 coupling agent.
- 1 9. The semiconductive power cable composition of Claim 8 wherein the coupling
2 agent reduces the amount of a curing agent required to impart heat resistance to the
3 semiconductive cable layer.

- 1 10. The semiconductive power cable composition of Claim 9 further comprising a
2 curing agent.
- 1 11. The semiconductive power cable composition of Claim 1 wherein the mixture
2 further comprises a compatibilizing polymer.
- 1 12. A semiconductive cable layer prepared from the semiconductive power cable
2 composition of Claim 1.
- 1 13. A power cable construction prepared by applying the semiconductive cable
2 layer of Claim 12 over a wire or cable.
- 1 14. A process for preparing a semiconductive power cable composition
2 comprising the step of:
3 blending a mixture of a high-temperature polymer, a soft polymer, and a
4 conductive filler,
5 wherein
6 (i) a semiconductive cable layer prepared from the composition strippably
7 adheres to a second cable layer,
8 (ii) in the absence of a curing agent, the semiconductive cable layer having
9 a heat resistance of less than 100% as measured by a Hot Creep test at
10 a testing temperature of 150 degrees Centigrade,
11 (iii) the high temperature polymer being a polymer suitable to impart heat
12 resistance to the semiconductive cable layer, and
13 (iv) the soft polymer being a polymer that enhances the processing
14 characteristics of the high temperature polymer.
- 1 15. The process of Claim 14, wherein the mixture further comprises a coupling
2 agent.
- 1 16. A process for preparing a semiconductive power cable composition
2 comprising the steps of:
3 a. reactively-coupling a mixture of a high-temperature polymer, a soft
4 polymer, and a coupling agent, in the presence of a conductive filler, wherein
5 the coupling agent reduces the amount of a curing agent required to impart
6 heat resistance to a semiconductive cable layer prepared from a mixture of the
7 high-temperature polymer, the soft polymer, and the conductive filler in the
8 absence of the coupling agent; and
9 b. admixing a curing agent,

10 wherein a semiconductive cable layer prepared from the composition strippably
11 adheres to a second cable layer.

1 17. A process for preparing a power cable comprising the steps of:

2 a. extruding a semiconductive power cable composition comprising a
3 mixture of a high-temperature polymer, a soft polymer, and a conductive filler,
4 over a metallic conductor to yield a semiconductive cable layer over the
5 metallic conductor; and

6 b. extruding a polymer-dielectric insulation over the semiconductive
7 cable layer.

1 18. The process for preparing a power cable of Claim 17 further comprising the
2 step of

3 c. extruding a second semiconductive power cable composition over the
4 polymer-dielectric insulation to yield a second semiconductive cable layer.

1 19. A process for preparing a power cable comprising the steps of:

2 a. extruding a power cable semiconductive composition comprising a
3 mixture of a high-temperature polymer, a soft polymer, and a conductive filler,
4 over a metallic conductor to yield a semiconductive cable layer over the
5 metallic conductor;

6 b. extruding a chemically-crosslinkable insulation composition over the
7 semiconductive cable layer;

8 c. extruding a second semiconductive power cable composition over the
9 polymer-dielectric insulation to yield a second semiconductive cable layer;
10 and

11 d. crosslinking the chemically-crosslinkable insulation composition to
12 yield a crosslinked, polymer-dielectric insulation.